

Study Documents

Driver Monitoring of Inattention and
Impairment Using Vehicle Equipment
(DrIIVE) –

Track A: Develop and Evaluate a
System of Algorithms to Identify
Signatures of Alcohol-Impaired,
Drowsy, and Distracted Driving

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**National Advanced Driving
Simulator**

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1 APPENDIX A: INFORMED CONSENT DOCUMENT

INFORMED CONSENT DOCUMENT

Project Title: Driver Monitoring of Inattention and Impairment Using Vehicle Equipment
(Phase 2)

Principal Investigator: Timothy Brown

Research Team Contact: Dawn Marshall 319-335-4774

This consent form describes the research study to help you decide if you want to participate. This form provides important information about what you will be asked to do during the study, about the risks and benefits of the study, and about your rights as a research subject.

- If you have any questions about or do not understand something in this form, you should ask the research team for more information.
- You should discuss your participation with anyone you choose such as family or friends.
- Do not agree to participate in this study unless the research team has answered your questions and you decide that you want to be part of this study.

WHAT IS THE PURPOSE OF THIS STUDY?

This is a research study. We are inviting you to participate in this research study because you have a valid U.S. driver's license and have been a licensed driver for at least 2 years, are in good general health and are between the ages of 21 and 34.

The purpose of this research study is to develop methods of detecting distracted driving.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 154 people will take part in this study at the University of Iowa.

HOW LONG WILL I BE IN THIS STUDY?

If you agree to take part in this study, your involvement will include two study visits: a screening visit that will last for about 1 hour and 15 minutes and a study visit that will last for about 4 ½ hours.

WHAT WILL HAPPEN DURING THIS STUDY?

Screening Visit

During the first visit, you will first be asked to show your driver's license so we can confirm it is valid. You will then be asked to blow into a machine that measures your breath alcohol concentration level (BAC). If your BAC is above 0.000%, you will not be allowed to continue on the study.

At all points when your BAC is measured in this study, the results will only be recorded as "yes" or "no" that you meet the study requirement. The actual BAC level will not be recorded or kept. If your BAC is 0.08% or above, you will be advised that it is not legal for you to drive and asked if there is someone who can pick you up to provide a ride home or provided a ride home by taxi. If your BAC is greater than 0.03%, but less than 0.08% you will be advised against driving home and will be asked if someone pick you up or provided a ride home by taxi. If your BAC is less than 0.03%, you will be offered a ride home by taxi. If no one is available to give you a ride, NADS will pay for any taxi ride.

that is provided by Yellow Cab, however you are free to use another taxi company at your own expense.

If you meet all of the screening criteria and are eligible to continue in the study, you will be asked to watch a presentation that describes the driving simulator and the types of tasks you will do while you are driving in the simulator. These tasks will mimic activities people may do while driving, such as reading a text message or looking for music to play. You will practice the tasks before driving in the simulator. Then a staff member will take you to the simulator to show you the simulator controls and the screen where the tasks will be displayed. You will then complete a practice screening drive. The screening drive is a nighttime drive. During the screening drive you will drive in urban and suburban roadways and take an entrance ramp onto a freeway. You will also engage in the tasks a few times during the screening drive. The screening drive will last about 6 minutes. After the screening drive, we will schedule an appointment for your study visit.

Study Visit

During the study visit, you will be asked to take a BAC measurement again and if you have a BAC above 0.000% you will not be allowed to continue in the study. If you are able to continue in the study, you will watch a presentation that reviews the tasks you will do while you are driving in the simulator and you will be asked to practice these tasks. You will then complete three separate study drives that are each about 30-40 minutes long. The study drives simulate a drive home at night. During each study drive you will drive on urban, suburban, freeway and rural roadways. You will engage in the tasks periodically throughout the drives. Before the first drive, a staff member will review the simulator controls and task display with you. Between each drive you will have a break. After the last drive of the visit we will review a debriefing statement with you.

Video Recording

All driving trials in this study will be recorded on video. You will be asked to sign and date a video release statement at the screening visit. The digital cameras that are placed so that we are able to view your face, your interactions with the vehicle displays, and the driver's view of the forward scene. The placement of the cameras will allow the researchers to record the simulator controls and your response to driving events.

The simulator contains sensors that measure vehicle operation, vehicle motion, and your driving actions. The system also contains video cameras that capture images of you while driving (e.g., driver's hand position on the steering wheel, forward road scene). These sensors and video cameras are located in such a manner that they will not affect you or obstruct your view while driving. The information collected using these sensors and video cameras are recorded for analysis by research staff and may be used as described in the Confidentiality section below.

WHAT ARE THE RISKS OF THIS STUDY?

You may experience one or more of the risks indicated below from being in this study. In addition to these, there may be other unknown risks, or risks that we did not anticipate, associated with being in this study.

The risk involving driving the simulator is possible discomfort associated with simulator disorientation. Some participants in driving simulator studies reported feeling uncomfortable during or after the simulator drive. These feelings were usually mild to moderate and consisted of slight uneasiness,

warmth, or eyestrain. These effects typically last for only a short time, usually 10-15 minutes, after leaving the simulator. You may quit driving at any time if you experience any discomfort.

If you ask to quit driving as a result of discomfort, you will be allowed to quit at once. If you ask to quit driving due to discomfort, you will be escorted to a room, asked to sit and rest, and offered a beverage and snack. A trained staff member will determine if and when you will be allowed to leave. If you show few or no signs of discomfort, you will be able to go home or transportation will be arranged if you feel you are unable to drive home. If you experience anything other than slight effects, a follow-up call will be made to you 24 hours later to ensure you're not feeling ill effects.

In the rare event that normal exiting of the simulator is not available; you will need to exit the simulator through an alternative path. You will be assisted down a small ladder and escorted to a participant waiting room. This could pose a minimal risk if you have difficulty negotiating the ladder or walkway in the simulator bay.

Research staff will be present at all times to ensure your safety while you drive.

WHAT ARE THE BENEFITS OF THIS STUDY?

You will not benefit from being in this study.

However, we hope that, in the future, other people might benefit from this study because information gained from this study about how to detect distracted driving may lead to increased safety on roadways.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

WILL I BE PAID FOR PARTICIPATING?

You will be paid for being in this research study. You will need to provide your social security number (SSN) in order for us to pay you. You may choose to participate without being paid if you do not wish to provide your social security number (SSN) for this purpose. You may also need to provide your address if a check will be mailed to you. If your social security number is obtained for payment purposes only, it will not be retained for research purposes.

The total compensation available for this study is \$150 for completing both visits. You will be paid \$15 for attending the screening visit. The compensation is \$135 for completing all procedures during the study visit. If you are not able to complete the study visit, the compensation will be pro-rated based on the length of time you have participated in the study visit at a rate of \$7.50 for every 15 minutes of participation.

WHO IS FUNDING THIS STUDY?

National Highway Traffic Safety Administration is funding this research study. This means that the University of Iowa is receiving payments from National Highway Traffic Safety Administration to support the activities that are required to conduct the study. No one on the research team will receive a direct payment or increase in salary from National Highway Traffic Safety Administration for conducting this study.

WHAT ABOUT CONFIDENTIALITY?

We will keep your participation in this research study confidential to the extent permitted by law. However, it is possible that other people such as those indicated below may become aware of your participation in this study and may inspect and copy records pertaining to this research. Some of these records could contain information that personally identifies you.

- federal government regulatory agencies,
- auditing departments of the University of Iowa, and
- the University of Iowa Institutional Review Board (a committee that reviews and approves research studies)

To help protect your confidentiality, we will assign you a study number which will be used instead of your name to identify all data collected for the study. The list linking your study number and name will be stored in a secure location and will be accessible only to the researchers at the University of Iowa. All records and data containing confidential information will be maintained in locked offices or on a secure password protected computer systems that are accessible to the researchers, the study sponsor, and its agents. It is possible that persons viewing the video data may be able to identify you. Study documents will be kept in a locked cabinet within a secure building that can only be entered by research personnel. After completion of analysis, all hard copies except the Informed Consent Documents will be scanned, placed on a CD and placed into the NADS archival room that has limited access by designated archival personnel. The original Informed Consent Documents will be stored in the NADS archival room that has limited access by designated archival personnel.

The **engineering data** collected and recorded in this study (including any performance scores based on these data) will be analyzed along with data gathered from other participants. These data may be publicly released in final reports or other publications or media for scientific (e.g., professional society meetings), regulatory (e.g., to assist in regulating devices), educational (e.g., educational campaigns for members of the general public), outreach (e.g., nationally televised programs highlighting traffic safety issues), legislative (e.g., data provided to the U.S. Congress to assist with law-making activities), or research purposes (e.g., comparison analyses with data from other studies). Engineering data may also be released individually or in summary with that of other participants, but will not be presented publicly in a way that permits personal identification, except when presented in conjunction with video data.

The **video data** (video image data recorded during your drive) recorded in this study includes your video-recorded likeness and all in-vehicle audio including your voice (and may include, in some views, superimposed performance information). Video and in-vehicle sounds will be used to examine your driving performance and other task performance while driving. Video image data (in continuous video or still formats) and associated audio data may be publicly released, either separately or in association with the appropriate engineering data for scientific, regulatory, educational, outreach, legislative, or research purposes (as noted above).

The **simulator data** is captured and stored on hard drives located within a limited access area of the NADS facility. Access to simulator data is controlled through permissions established on a per-study basis.

If we write a report or article about this study, or share the study data set with others, we typically describe the study results in a summarized manner so that you cannot be identified by name.

IS BEING IN THIS STUDY VOLUNTARY?

Taking part in this research study is completely voluntary. You may choose not to take part at all. If you decide to be in this study, you may stop participating at any time. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

Can Someone Else End my Participation in this Study?

Under certain circumstances, the researchers might decide to end your participation in this research study earlier than planned. This might happen if you fail to operate the research vehicle in accordance with the instructions provided, or if there are technical difficulties with the driving simulator.

WHAT IF I HAVE QUESTIONS?

We encourage you to ask questions. If you have any questions about the research study itself, or if you experience a research-related injury please contact: Timothy Brown (319-335-4785).

If you have questions, concerns, or complaints about your rights as a research subject or about research related injury, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. General information about being a research subject can be found by clicking "Info for Public" on the Human Subjects Office web site, <http://hso.research.uiowa.edu/>. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

This Informed Consent Document is not a contract. It is a written explanation of what will happen during the study if you decide to participate. You are not waiving any legal rights by signing this Informed Consent Document. Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subject's Name (printed): _____

Do not sign this form if today's date is on or after EXPIRATION DATE: 04/16/15.

(Signature of Subject)

(Date)

Statement of Person Who Obtained Consent

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative. It is my opinion that the subject understands the risks, benefits, and procedures involved with participation in this research study.

(Signature of Person who Obtained Consent)

(Date)

2 APPENDIX B: VIDEO RELEASE FORM

CONSENT FOR RELEASE OF VIDEO IMAGE AND AUDIO DATA

I, the undersigned, have agreed to participate in a research project to be conducted at the University of Iowa entitled "Driver Monitoring of Inattention and Impairment Using Vehicle Equipment (Phase 2)." The purpose of the study is to develop methods of detecting distracted driving. As part of the informed consent form I have signed for that study, I have agreed to allow the University to record and use for research purposes video image data (including my video-recorded likeness) and audio data (including my voice), as well as, in some views, superimposed performance information (referred to below as "the Recording"). This Consent for Release of Video Image and Audio Data pertains to the following non-research purposes the University proposes for my video image data (in continuous video or still formats) and associated audio data, either separately or in association with the appropriate engineering data:

- 1) Public release for regulatory purposes to assist in regulating devices;
- 2) Public release for educational purposes to assist with educational campaigns for members of the general public;
- 3) Public release for outreach purposes, such as nationally-televised programs highlighting traffic safety issues;
- 4) Public release for legislative purposes, such as to assist the U.S. Congress with law-making/rule-making activities.

Engineering data may also be released individually or in summary with that of others participating in the study, but will not be presented publicly in a way that permits personal identification, except when presented in conjunction with video image data.

I hereby authorize the University of Iowa, the study sponsor, and those acting pursuant to its authority, to use my recorded video image and audio data, with or without related engineering data, for the non-research purposes specified above.

I transfer and assign to the University of Iowa and the study sponsor any right, title, and interest I may have in and to the Recording, including the copyright, and in and to all works based upon, derived from, or incorporating the recorded data.

I irrevocably waive any right to inspect, edit, or approve said Recording in any of its forms.

I irrevocably release the University of Iowa and the study sponsor, and any of their employees, agents, and assigns, from any and all claims that I may have at any time arising out of, or related to, the Recording or use of the Recording, including, but not limited to, any claims based on the right of privacy, libel, or defamation.

Name of Participant

Signature of Participant

Date

3 APPENDIX C: MODERATE TEXT MESSAGE TASK

1	I am home sick today. I have a headache. Will check email.
2	Got Shower invitation. Can't wait. John will stop by next week.
3	Sorry I missed your birthday. Think of you often. Let's get together soon.
4	Kids have dance class. Joan will cover for me. Let me know if I'm needed.
5	Used 90% of your data. Manage plan online. This is a free message.
6	Do you have Pyramid catalog? Can't find mine. Save yours for me?
7	Won at casino! Bought dinner for everyone. Sorry you missed it.
8	At meeting room. Moving posters to other room. Bring cardboard tube.
9	Haven't heard from Katie. Meet at my place? I have the fabric.
10	Caught pants on shelves. Tore pocket off. Where is white thread?

4 APPENDIX D: DIFFICULT TEXT MESSAGE TASK

1	I got shower invite cant wait what brand of wipes diapers and formula do they use also john wasn't invited so he wants to stop by and give them a gift next week
2	Jess hit a deer right mirror fell off widow all scratched front fender and both doors now she has to pay again to get it fixed Having a bad couple of months
3	Cant believe I missed your birthday How are you I think of you often and hope you and the fam are doing ok we need to get together sometime very soon Love ya
4	FYI joan said she will cover me from 4-530 on most Tuesdays due to kids dance class only during work hours thank you and if there are questions please let me know
5	got some dates the cabin is open for fishing trip June 14 June 21 July 26 trip will Saturday to Saturday anyone have a preference the July date it would be warmer
6	DATA ALERT: Your acct used abt 90% of its data allowance for the bill ending the 20th. Manage your plan at vzwmobile.com/usg. As of 11/17 08:34 AM EST. FREE MSG
7	Do you get the pyramid collection catalog I saw some possible gifts in there for birthdays but I can't find my copy probably recycled would you save yours for me
8	Won big at the casino tonight had a blast Fred and Joan there too so I bought dinner and drinks with winnings for everyone maybe next time sorry you missed it
9	in the hallway outside the meeting room they will be taking the posters over to where we are having dinner grab the cardboard tube from your car on the way over
10	havent heard from Katie about tonight want to meet at my place around 8 or is it easier for me to meet you somewhere picked up some cotton fabric for the lining

5 APPENDIX E: WELLNESS SURVEY

STUDY: DrIVE Track A
PARTICIPANT: _____
VISIT: _____
DATE: _____

WELLNESS SURVEY

Directions: Circle one option for each symptom to indicate whether that symptom applies to you right now.

- | | | | | |
|--------------------------------|------|--------|----------|--------|
| 1. General Discomfort | None | Slight | Moderate | Severe |
| 2. Fatigue | None | Slight | Moderate | Severe |
| 3. Headache | None | Slight | Moderate | Severe |
| 4. Eye Strain | None | Slight | Moderate | Severe |
| 5. Difficulty Focusing | None | Slight | Moderate | Severe |
| 6. Salivation Increased | None | Slight | Moderate | Severe |
| 7. Sweating | None | Slight | Moderate | Severe |
| 8. Nausea | None | Slight | Moderate | Severe |
| 9. Difficulty Concentrating | None | Slight | Moderate | Severe |
| 10. *"Fullness of the Head" | None | Slight | Moderate | Severe |
| 11. Blurred Vision | None | Slight | Moderate | Severe |
| 12. Dizziness with Eyes Open | None | Slight | Moderate | Severe |
| 13. Dizziness with Eyes Closed | None | Slight | Moderate | Severe |
| 14. **Vertigo | None | Slight | Moderate | Severe |
| 15. ***Stomach Awareness | None | Slight | Moderate | Severe |
| 16. Burping | None | Slight | Moderate | Severe |
| 17. Vomiting | None | Slight | Moderate | Severe |
| 18. Other _____ | None | Slight | Moderate | Severe |

* Fullness of the head is an awareness of pressure in the head.

**Vertigo is experienced as loss of orientation with respect to vertical upright.

***Stomach awareness is a feeling of discomfort which is just short of nausea.

6 APPENDIX F: DEBRIEFING STATEMENT

Distraction Study Debriefing Statement

Thank you so much for participating in this study. Your participation was very valuable to us.

In this study, we were interested in gathering data about distracted driving. Because one of the ways we are trying to understand distraction and how to detect it is how you chose to engage in a task, it is important that you not discuss strategies for responding to the tasks with anyone else until the study is complete. Our efforts will be greatly compromised if participants come into the study knowing ways to make the tasks easier. To this end, we would ask that you not discuss any of the details of the study until March 1, 2015.

7 APPENDIX G: PHONE SCREENING

DRIVE Track A Phase 2 Telephone Screening Procedures

For a participant to be eligible for a study they must meet **ALL** of the following criteria:

- ♦ Be able to participate when the study is scheduled
- ♦ Meet all inclusion criteria
- ♦ Pass the phone health screening questions

Overview

The purpose of this research study is to develop methods of detecting distracted driving.

Participating in this study involves two study visits. The first is a screening visit and will last 1 to 1½ hours. The second will last 4 to 4 ½ hours. You will be required to come to University Research Park (formerly the Oakdale Campus) for both visits to participate.

Participation involves signing a consent form. You will receive instructions regarding driving the simulator and the study drive at your visit.

Compensation for participating in this study will be \$150 total for both study visits.

- **Are you still interested in participating?**
 - If YES, continue with Inclusion Criteria
 - If NO, ask if he/she would like us to keep him/her in our recruitment database for consideration of future participation.
 - IF NOT interested in future studies and wish to be removed from database
 - Make note regarding deletion
 - Reason if given

Inclusion Criteria ~ General Questions

Overview

Before this list of questions is administered, please communicate the following:

- There are several criteria that must be met for participation in this study. I will need to ask you several questions to determine your eligibility.

Proceed to Closing if an answer does not meet study criteria.

- 1) **Do you possess a valid U.S. Drivers' License?**
Must answer "yes".
- 2) **How long have you been a licensed driver?**
Must be more than 1 year.
- 3) **What restrictions do you have on your license?**
Must have no restrictions other than vision restrictions (B Corrective Lenses)
- 4) **How many miles do you drive per year?**
Must be at least 10,000 miles per year.
- 5) **Do you require any special equipment to help you drive such as pedal extensions, hand brake or throttle, spinner wheel knobs or other non-standard equipment?**
Must not require any special equipment.
- 6) **How old are you?**
Must be 21-34 years old.

General Questions Inclusion Criteria are met – proceed to Specific Questions Inclusion Criteria

Inclusion Criteria ~ Specific Questions Track A

Proceed to Closing if an answer does not meet study criteria.

- 1) **What types of non-driving tasks do you engage in while operating motor vehicles?**
Engages in tasks while driving, such as, talking on phone, texting, emailing, eating, and changing CD or other potential distracting tasks.

Specific Inclusion Criterion is met – proceed to General Health Exclusion Criteria

General Health Exclusion Criteria

1.1.1 Overview

1.1.2 Before administering this list of questions, please communicate the following:

- Because of pre-existing health conditions, some people are not eligible for participation in this study.
- I need to ask you several health-related questions before you can be scheduled for a study session.
- **Your responses are voluntary and all answers are confidential.**
- You can refuse to answer any questions
- No responses will be recorded.

- If a participant fails to meet one of the following criteria, proceed to the Closing

1) If the subject is female:

- Are you, or is there any possibility that you are pregnant? Or, are you currently breast feeding?

Exclusion criteria:

- If pregnant or there is any possibility of being pregnancy

2) Have you been diagnosed with a serious illness?

a. If YES, is the condition still active?

b. Are there any lingering effects?

If YES, do you care to describe?

Exclusion criteria:

- Cancer (receiving any radiation and/or chemotherapy treatment within last 6 months)
- Crohn's disease
- Hodgkin's disease
- Parkinson's disease
- Currently receiving any radiation and/or chemotherapy treatment

3) Do you have Diabetes?

NOTE: Type II Diabetes accepted if controlled (medicated and under the supervision of physician)

Exclusion criteria:

- Type I Diabetes - insulin dependent
- Type II – Uncontrolled (see above)

4) Do you suffer from a heart condition such as disturbance of the heart rhythm or have you had a heart attack or a pacemaker implanted within the last 6 months?

If YES, please describe?

Exclusion criteria:

- History of ventricular flutter or fibrillation
- Systole requiring cardio version (atrial fibrillation may be acceptable if heart rhythm is stable following medical treatment or pacemaker implants)

5) Have you ever suffered brain damage from a stroke, tumor, head injury, or infection?

- If YES, what are the resulting effects?
- Do you have an active tumor?
- Any visual loss, blurring or double vision?
- Any weakness, numbness, or funny feelings in the arms, legs or face?
- Any trouble swallowing or slurred speech?
- Any uncoordination or loss of control?
- Any trouble walking, thinking, remembering, talking, or understanding?

Exclusion criteria:

- A stroke within the past 6 months
- An active tumor
- Any symptoms still exist

<p>6) Have you ever been diagnosed with seizures or epilepsy?</p> <p>➤ If YES, when did your last seizure occur?</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • A seizure within the past 12 months
<p>7) Do you have Ménière's Disease or any inner ear, dizziness, vertigo, hearing, or balance problems?</p> <p>➤ Wear hearing aides - full correction with hearing aides acceptable</p> <p>➤ If YES, please describe.</p> <p>➤ Ménière's Disease is a problem in the inner ear that affects hearing and balance. Symptoms can be low-pitched roaring in the ear (tinnitus), hearing loss, which may be permanent or temporary, and vertigo.</p> <p>➤ Vertigo is a feeling that you or your surroundings are moving when there is no actual movement, described as a feeling of spinning or whirling and can be sensations of falling or tilting. It may be difficult to walk or stand and you may lose your balance and fall.</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Meniere's Disease • Any recent history of inner ear, dizziness, vertigo, or balance problems
<p>8) Do you currently have a sleep disorder such as sleep apnea, narcolepsy, or Chronic Fatigue Syndrome?</p> <p>➤ If YES, please describe.</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Untreated sleep apnea • Narcolepsy
<p>9) Do you have migraine or tension headaches that require you to take medication daily?</p> <p>➤ If YES, please describe.</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Any narcotic medications
<p>10) Do you currently have untreated depression, drug dependency, anxiety disorder, ADHD or claustrophobia?</p> <p>➤ If YES, please describe</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Untreated depression and ADHD • Dependency or abuse of psychoactive drugs, illicit drugs, or alcohol • Agoraphobia, hyperventilation, or anxiety attacks
<p>11) Are you currently taking any prescription or over the counter medications?</p> <p>➤ If YES, what is the medication?</p> <p>➤ Are there any warning labels on your medications, such as potential for drowsiness?</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • Sedating medications or drowsiness label on medication UNLESS potential participant indicates they have been on the medication consistency for the last 6 months AND states they have NO drowsiness effects from this medication
<p>12) Do you experience any kind of motion sickness?</p> <p>➤ If YES, what were the conditions you experienced: when occurred (age), what mode of transportation, (boat, plane, train, car), and what was the intensity of your motion sickness?</p> <p>➤ On a scale of 0 to 10, how often do you experience motion sickness with 0 = Never and 10 = Always</p> <p>➤ On a scale of 0 to 10, how severe are the symptoms when you experience motion sickness with 0 = Minimal and 10 = Incapacitated</p>
<p>Exclusion criteria:</p> <ul style="list-style-type: none"> • One single mode of transportation where intensity is high and present • More than 2 to 3 episodes for mode of transportation where intensity is moderate or above • Severity and susceptibility scores rank high

Closing

MEETS ALL CRITERIA

Instructions:

- Refrain from drinking alcohol and taking any **NEW** prescription or over the counter drugs for the 24 hours preceding your driving session. If you do need to take a new medication 24 hours preceding your driving session, please call us. Ibuprofen, Tylenol, aspirin, and vitamins are acceptable to take prior to driving session.
- Bring Driver's License with you to appointment.
- We ask that cell phones and pagers be turned off or left home or in your car outside as they are not allowed while participating in the driving study.
- Request the following of all participants:
 - Wear flat shoes to drive in
 - No hats worn or gum chewing allowed while driving
 - Refrain from wearing artificial scents (perfume or cologne) as some staff allergic to scents
- You will be required to wear a seat belt while driving.
- If your appointment is before 8am or after 5pm, the front door will be locked, therefore, please use the After Hours Call Box located at the right side on the front door. Press the call button and someone will let you in.
- Inform participants to call **(319) 335-4313** if they are unable to make this appointment and need to reschedule as soon as possible (prefer 24 hour notice). Please leave a message if they receive voicemail and a staff member will return their call.

Provide directions, explain where to park and ask them to check in at the front desk inside the main entrance.

DOES NOT MEET CRITERIA:

- Inform participant that they may qualify for a future study and ask if they wish to remain in our database to be called for future studies.
- If participant is not in our database, ask if they would like to be considered for future driving research studies, if yes, fill out NADS database form.

Advertisement



Adults ages 21-34 are invited to participate in a driving simulator study about distractions while driving. You would be required to attend 1 daytime or evening visit up to 1½ hours and one daytime or evening visit up to 4½ hours in length. You will be paid for your time and effort.

For more information, call 319-335-4719 or go to www.drivingstudies.com

8 APPENDIX H: ADVERTISEMENT

9 APPENDIX I: ADVERTISEMENT EMAIL

Subject: Participants Invited for Driving Study

Adults ages 21-34 are invited to participate in a driving simulator study about distractions while driving. You would be required to attend 1 daytime or evening visit up to 1½ hours and one daytime or evening visit up to 4½ hours in length. You will be paid for your time and effort.

For more information, call 319-335-4719 or go to www.drivingstudies.com

10 APPENDIX J: ADVERTISEMENT ON DRIVINGSTUDIES.COM

Distracted Driving

Adults ages 21-34 are invited to participate in a driving simulator study about distractions while driving. You would be required to attend 1 daytime or evening visit up to 1½ hours and one daytime or evening visit up to 4½ hours in length. You will be paid for your time and effort.

FOR MORE INFORMATION:

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11 APPENDIX K: ADVERTISEMENT ON NADS WEBSITE



DRIVING STUDIES .com

HELP WANTED

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Distracted Driving

Adults ages 21-34 are invited to participate in a driving simulator study about distractions while driving. You would be required to attend 1 daytime or evening ...

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12 APPENDIX L: ALGORITHM MEASURES

Table 1. Raw data recorded for all algorithms

Variable	Description
CFS_Accelerator_Pedal_Position	Throttle pedal position (0-1)
CFS_Brake_Pedal_Force	Brake pedal force (lbf)
CFS_Steering_Wheel_Angle	Steering wheel angle (degrees)
SCC_Lane_Deviation_Lane	Current lane ID
SCC_Lane_Deviation	Lane position (ft)
SCC_Lane_Deviation_Width	Width of current lane (ft)
SCC_Lane_Depart_Warn_LeftDist	Distance from left front corner of vehicle to left lane edge (ft)
SCC_Lane_Depart_Warn_RightDist	Distance from right front corner of vehicle to right lane edge (ft)
SCC_Lane_Depart_Warn_Heading	Current heading angle in the lane (degrees)
SCC_OwnVeh_Curvature	Radius of curvature of road (ft)
VDS_Veh_Speed	Vehicle speed (mph)
VDS_Chassis.CG_Accel_Fwd	Longitudinal vehicle acceleration (ft/s/s)
VDS_Chassis.CG_Accel_Right	Lateral vehicle acceleration (ft/s/s)
StrDes	Double exponentially smoothed steering wheel angle (see Track B Interim Report)
StrdDes	Double exponentially smoothed steering wheel angle rate (see Track B Interim Report)
Events	Current event number
Order	Current event ordinal value (count)
isLaneDeparture	Is the vehicle currently departed from the lane? (binary)
isLaneChange	Is the vehicle currently changing lanes (binary)
PRC17s	Percent Road Center over previous 17 seconds (%)
AttendD	AttendD buffer output (seconds)
Speed_Limit	Speed limit (mph)
Steer_Reverse_VLarge	Very large steering reversals [Gap size = 6 deg, LPF cutoff = 0.6 Hz](Anttila & Luoma, 2005)
Steer_Reverse_Large	Large steering reversals [Gap size = 3 deg, LPF cutoff = 0.6 Hz]
Steer_Reverse_Small	Small steering reversals [Gap size = 0.1 deg, LPF cutoff = 2 Hz]
TLC	Time to lane crossing (seconds) (see Mattsson (2007))
TLC_Minima	Time to lane crossing minima (see Östlund et al., 2005)
Lane_Deviation_Modified	Modified lateral position variation (MSDLP) (Östlund et al., 2005) [note: misnames in files as Lane_Departure_Modified]
Road_Demand_Metric	Road demand metric (0-100) (see Dingus, Hulse, Antin, and Wierwille (1989))

Track_State	Eye tracking state
Gaze_Qual_L	Left eye gaze quality
Gaze_Qual_R	Right eye gaze quality
Gaze_Rot_X	Gaze rotation on X axis
Gaze_Rot_Y	Gaze rotation on Y axis
Gaze_Proj_Horiz	Horizontal gaze projected onto camera plane
Gaze_Proj_Vert	Vertical gaze projected onto camera plane
OncenterGaze	On center gaze, normalized using radius of 8 degrees (see Victor, Harbluk, and Engström (2005)). Has value of one at the ellipse boundary
isOnCenter	Is the on center gaze measure less than one?
Gaze_Horiz_0	Calibrated horizontal gaze center
Gaze_Vert_0	Calibrated vertical gaze center
Gaze_Location	Coded gaze location in world (uses numbers instead of names)
Gaze_Front_Cone	Is the gaze inside a 90 degree front cone? (used for AttenD)
Hpos_Conf	Head position confidence
Hpos_Filt_X	Filtered head position on X axis
Hpos_Filt_Y	Filtered head position on Y axis
Hpos_Filt_Z	Filtered head position on Z axis
Hrot_Filt_E0	Head rotation Euler angle 0
Hrot_Filt_E1	Head rotation Euler angle 1
Hrot_Filt_E2	Head rotation Euler angle 2
Head_Horiz_Rot_0	Calibrated horizontal head rotation center
Head_Vert_Rot_0	Calibrated vertical head rotation center
Head_Horiz_Pos_0	Calibrated horizontal head position center
Head_Vert_Pos_0	Calibrated vertical head position center
Head_Depth_Pos_0	Calibrated fore/aft head position center
Head_Horiz_Proj	Horizontal head rotation projected onto camera plane
Head_Vert_Proj	Vertical head rotation projected onto camera plane

Table 2. Measures aggregated into one second segments, common among all algorithms

Measure	Description
subject_first	Participant number for drive
scenario_first	Scenario version of drive
attenddd_max	Maximum AttenD buffer value in segment
str_des_mean	Mean value of double exponential smoothed steering wheel angle in segment
str_des_sd	Standard deviation of double exponential smoothed steering wheel angle in segment

strd_des_mean	Mean value of double exponential smoothed steering wheel angle rate in segment
strd_des_sd	Standard deviation of double exponential smoothed steering wheel angle rate in segment
throttle_mean	Mean throttle pedal position in segment
throttle_sd	Standard deviation of throttle pedal position in segment
brake_mean	Mean brake pedal force in segment
brake_sd	Standard deviation of brake pedal force in segment
steer_mean	Mean steering wheel angle in segment
steer_sd	Standard deviation of steering wheel angle in segment
lanedev_mean	Mean lane deviation in segment
lanedev_sd	Standard deviation of lane deviation (SDLP) in segment
curvature_max	Maximum road radius of curvature in segment
speed_mean	Mean vehicle speed in segment
speed_sd	Standard deviation of vehicle speed in segment
Ax_mean	Mean longitudinal acceleration
Ax_sd	Standard deviation of longitudinal acceleration
Ax_p2p	Peak-to-peak longitudinal acceleration over segment
Ay_mean	Mean lateral acceleration
Ay_sd	Standard deviation of lateral acceleration
Ay_p2p	Peak-to-peak lateral acceleration over segment
events_mode	Mode of event number in segment
prc17_max	Maximum of Percent Road Center measure over segment
speedlimit_mode	Mode of speed limit over segment
srrvlarge_count	Number of very large steering reversals in segment
srrlarge_count	Number of large steering reversals in segment
srrsmall_count	Number of small steering reversals in segment
tlc_mean	Mean time to lane crossing
tlc_min	Minimum time to lane crossing
lanedevmod_mean	Mean modified lateral position variation
lanedevmod_sd	Standard deviation of modified lateral position variation
q_max	Maximum road demand metric over segment
headhoriz_mean	Mean projected horizontal head direction
headhoriz_sd	Standard deviation of projected horizontal head direction
headvert_mean	Mean vertical projected vertical head direction
headvert_sd	Standard deviation of projected vertical head direction
headconf_mean	Mean head confidence value
headconf_max	Maximum head confidence value
headconf_pct	Percent of time with high head confidence in segment

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